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Some Comments on Cloud Cover, Processing and Exposure

An examination of the processing data (1) for the film from the Panoramic cameras in Missions 9056, 9057, 1001, 1002 and 9062 yields the results indicated in Table 1.

Table 1

% of Film Processed Under Conditions Noted

<u>Mission No.</u>	<u>Primary</u>	<u>Intermediate</u>	<u>Full</u>
9056	--	44*	56
9057	--	7	93
1001	--	--	100
1002	M	S	S
9062	--	27	73

- \* 69% Master film was processed intermediate. Much of this film was fogged, apparently due to light leak. 19% Slave film was processed intermediate.
- M Majority of Master film processed primary; high level of fog was present, apparently due to light leak.
- S Slave film processed either intermediate or full; no percentages available.

Comparison of Processing With Cloud Cover

Some correlation between cloud cover and processing level might be expected. This correlation was explored, particularly for those missions employing more than one processing level.

The average cloud cover data (2) during all the operational passes

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of a particular mission are compared in Table 2 with the approximate average cloud cover for those passes in that mission processed intermediate.

Table 2Mission No. 9057

	% of Cloud Cover					Average Cloud Cover %/pass
	≤10	10-25	26-50	51-99	100	
Mission Average	17.0	7.2	13.1	50.0	12.7	57.3
Average for Int.Processing	18.8	4.4	7.5	53.0	16.4	60.5
<u>Mission No. 9062</u>						
Mission Average	41.9	9.2	9.3	26.2	13.4	40.3
Average for Int.Processing	32.5	10.6	7.3	33.2	16.5	47.6

Appropriate data for the other missions are not available. Since that film from Missions 9057 and 9062 not processed intermediate was processed full, there is an obvious lack of correlation between heavier than average cloud cover and full processing.

This conclusion is reinforced by individual passes with minimum cloud cover (5%) which were processed full (e.g., 9057 - 24A, 57D; 9062 - 25D).

Discussion

The above data clearly indicate a tendency toward full processing. This in no way implies that substantial amounts of intelligence information of value are being lost by "overprocessing". Indeed, a compilation of density data presented by [redacted] during the Users' Subcommittee visit to Eastman Kodak Company (3) indicated that the shoulder or toe of the characteristic curve was reached in relatively few cases.

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The disturbing factor is this. Exposure determination is made by the mission planners on the basis of an intermediate processing curve (4). A tentative conclusion is that less exposure, on the average, is ordinarily obtained than expected. This might be due to the use of too large a value for the average luminance of an aerial scene on which the Exposure Value Number - Solar Altitude curve is based.

The experimental determinations of the variation of apparent scene luminance with solar altitude involved a limited series of aircraft tests (Spokane, 1955; Red Dot 12/56-6/58) over a restricted geographical area.

It would appear that a re-examination of exposure criteria based upon operational results is in order. If consistently less than expected average exposure is being obtained, less margin for error is left before intelligence is lost. To this end it is recommended that more communication and closer liaison be promoted between the mission planners and the processors.

REFERENCES

- (1) "Processing Summary for Mission \_\_\_\_".
- (2) "Cloud Cover Information" for appropriate Mission.
- (3) "Subcommittee Report of Type 4404 Film with the Corona Camera"
- (4) "Current Method for M & J Systems Exposure Determination".

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